AMENDMENTS TO THE CLAIMS

Pursuant to 37 C.F.R. § 1.121, the following listing of clams will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Currently amended) A BDPD-based (Base-band Digital Pre-Distortion) method for improving efficiency of an RF power amplifier, comprising:

(1) Determining structural parameters of a neural network as required and establishing the neural network, inputting modeling data and initial values of network parameters required for establishing ~~the~~ a neural network model of the RF power amplifier;

(2) Propagating forward with the input data and network parameters, calculating the difference between an output value of the neural network and ~~the~~ an expected output value, then propagating backward along the neural network with said difference to correct the network parameters;

(3) Determining whether said difference meets ~~the~~ a specified criterion; if so, outputting the neural network model of the RF power amplifier and going to step (4), otherwise inputting the corrected network parameters to the neural network and going to step (2);

(4) Solving ~~the~~ a pre-distortion algorithm of the RF power amplifier with said neural network model;

(5) Carrying out pre-distortion processing for an input signal of the RF power amplifier with said pre-distortion algorithm and then feeding ~~them~~ the processed input signal to the RF power amplifier.

2. (Currently amended) A BDPD-based method for improving efficiency of RF power amplifier according to claim 1, wherein

said structural parameters comprise: ~~the~~ a number n of delay items of input signal, ~~the~~ a number r of neural elements on each layer of the neural network, ~~the~~ a number m of layers of the neural network;

said modeling data comprises: output signal Y(KT), input signal, and delay items of

input signal of the power amplifier;

said network parameters comprise: weight Wijk and bias bij;

said output signal Y(KT) of the RF power amplifier is the expected output value corresponding to the input signal~~, i.e., the actual output value of the RF power amplifier corresponding to the input signal~~.

3. (Original) A BDPD-based method for improving efficiency of RF power amplifier according to claim 2, wherein said input signal and said delay items of the input signal are base-band digital signal amplitude X(KT) of the power amplifier and delay items thereof X[(K-1)T] ... X[(K-n+1)T], respectively.

4. (Currently amended) A BDPD-based method for improving efficiency of RF power amplifier according to claim 3, wherein the number n of delay items of input signal is: 1[[□]] ≤ n ≤ [[□]]10, the number r of neural elements on each layer of the neural network is: 1[[□]] ≤ r [[□]] ≤10, the number m of layers of the neural network is: 1[[□]] ≤ m[[□]] ≤ 10.

5. (Original) A BDPD-based method for improving efficiency of RF power amplifier according to claim 2, wherein said input signal and said delay items of input signal are base-band digital signal amplitude X(KT) of the power amplifier and delay items thereof X[(K-1)T], X[(K-2)T], ..., X[(K-n+1)T] as well as phase $\Phi_{in}(KT)$ of the base-band digital signal and delay items thereof $\Phi_{in}[(K-1)T]$, $\Phi_{in}[(K-2)T]$, ..., $\Phi_{in}[(K-n+1)T]$; the number of delay items of the input signal comprises the number n1 of delay items of base-band digital signal amplitude and the number n2 of delay items of base-band digital signal phase.

6. (Currently amended) A BDPD-based method for improving efficiency of RF power amplifier according to claim 5, wherein the number n1 of delay items of the base-band digital signal amplitude is: 1[[□]]≤n1[[□]] ≤5, the number n2 of the delay items of base-band digital signal phase is: 1[[□]]≤n2[[□]]≤10, the number r of neural elements on each layer of the

neural network is: 1[[□]]≤r[[□]]≤10, the number m of layers of the neural network is: 1 [[□]] ≤m[[□]]≤10.

7. (Currently amended) A BDPD-based method for improving efficiency of RF power amplifier according to claim 2, wherein said step (2) further comprises:

(71) Calculating ~~the~~ corresponding intermediate variables Vij of the neural network with network parameters Wijk of each layer of the neural network;

(72) Activating ~~the~~ a function to calculate ~~the~~ an output value Yij of each neural element in the corresponding neural network through the intermediate variables Vij and the neural elements;

(73) Magnifying the output value of the neural elements on ~~the~~ a last layer of the neural network for m times to obtain ~~the~~ an output value Ym(KT) of the neural network, herein the value of M being higher than the saturation level of the RF power amplifier;

(74) Calculating the difference between Ym(KT) and actual output Y(KT) of the RF power amplifier;

(75) Magnifying the difference e(kT) between Ym(KT) and Y(KT) for -m times and calculating Ω(Vij) with output value Vij of the neural elements on the last layer of the network, herein,Ω(v)=dΨ(v)/dv;

(76) Multiplying Me(kT) with Ω(Vij) to obtain δij;

(77) Propagating δij backward along the network channel, in which propagating forward is carried out, with current values of network parameters and obtaining the intermediate variables ui1, ui2, ..., uir;

(78) Calculating intermediate variables δi1, δi2, ..., δir with ui1, ui2, ..., uir and current network parameters;

Herein, δi1, δi2, ..., δir are obtained through multiplying Ω(Vi1), Ω(Vi2), ..., Ω(Vir) with ui1, ui2, ... uir respectively, said Ω(Vi1), Ω(Vi2), ... Ω(Vir) are calculated out with intermediate variable vi1, vi2, ..., vir;

(79) Updating current network parameters with δi1, δi2, ..., δir, and calculating c with the following equation: $c=[\sum(\delta i1^2[[\square]]\underline{+}\delta i2^2[[\square]]\underline{+}...+\delta ir^2)+\delta ij^2]^{1/2}$;

Wherein when updating the current network parameters, the updated network parameters Wijk and bij are calculated out as follows:

Wijk= value of network parameter before update - $\eta \times \delta ij$ $\times$ output value of corresponding neural elements, herein η is the searching step length;

bij = value of network parameter before update - $\eta \times \delta ij$.

8. (Original) A BDPD-based method for improving efficiency of RF power amplifier according to claim 7, wherein said step (3) comprises: determining whether c meets the criterion; if so, outputting the neural network model of the RF power amplifier, otherwise inputting the corrected network parameters Wijk and bij to the neural network and going to step (71).

9. (Original) A BDPD-based method for improving efficiency of RF power amplifier according to claim 7, wherein said K = 2 $\times$ mean gain kb of RF power amplifier.

10. (Currently Amended) A BDPD-based method for improving efficiency of RF power amplifier according to claim 2, wherein ~~the~~ a bandwidth of said input signal is wider than that of actual input signal of RF power amplifier.